



Managing Geriatric Delirium: Pearls and Pitfalls

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Learning Objectives

- 1) describe 3 practical measures when managing geriatric delirium, and 3 pitfalls
- 2) discuss the advantages and disadvantages of various classes of psychotropic medications for the treatment of geriatric delirium
- 3) understand the role but limitations of the use of benzodiazepines in alcohol withdrawal delirium, and the emerging role of anticonvulsants



Screening

- ★ Under-recognition, esp. in those:
 - ★ Over 80 y.o. with hypoactive delirium with visual impairment and/or pre-existing dementia (Inouye et al. Arch Int. Med 2001)
- ★ No reliable screening tool to differentiate delirium and dementia (Meagher, J. Neurol. Neurosurg Psych, Aug 2010)
 - ★ Inattention still best, sleep and motor disturbance helpful
 - ★ perhaps Digit span forward <4 can differentiate (?)
 - ★ Dementia with delirium pts have more cognitive impairment
- ★ Practically, acute-onset and/or fluctuation in cognition/function/abnormal behaviours



CAM-Short Form

CAM: Confusion Assessment Method

The diagnosis of delirium requires the presence of features 1 and 2, *plus* either 3 or 4.

Feature 1: Acute onset and fluctuating course

This feature is usually confirmed by comments of a family member or health care professional and is shown by positive responses to the following questions:

- Is there evidence of an acute change in mental status from the patient's baseline?
- Does the (abnormal) behavior fluctuate during the day, tending to come and go, or increase and decrease in severity?

Feature 2: Inattention

This feature is shown by a positive response to the following question:

- Does the patient have difficulty focusing attention? For example, is the patient easily distracted or having difficulty keeping track of what is being said?

Feature 3: Disorganized thinking

This feature is demonstrated by a positive response to the following question:

- Is the patient's thinking disorganized or incoherent, as evidenced by rambling or irrelevant conversation, unclear or illogical flow of ideas, or unpredictable switching from subject to subject?

Feature 4: Altered level of consciousness

This feature is shown by one answer other than "alert" to the following question:

- Overall, how would you rate the patients level of consciousness?
 - Alert (normal)
 - Vigilant (hyperalert)
 - Lethargic (drowsy, easily aroused)
 - Stuporous (drowsy, difficult to arouse)
 - Comatose (unarousable)



Differential Dx: DIMS-R

DIMS-R (Drugs, Infection, Metabolic, Structural, Retention): Common precipitating factors for delirium

Drugs

- Prescribed (narcotics, steroids, anticholinergic, NSAIDs)
- Over-the-counter (dimenhydrinate, diphenhydramine)
- Drug intoxication or withdrawal (alcohol, sedative-hypnotics, narcotics)

Infection (urinary tract, lungs, skin, blood)

Metabolic disturbances

- Fluid (dehydration, hypovolemia)
- Electrolyte (sodium, potassium, magnesium)
- Nutrition (malnutrition, thiamine deficiency, anemia)

Structural insults

- Cardiovascular (angina, infarction, congestive heart failure)
- Central nervous system (stroke or ischemia, concussion)
- Pulmonary (hypoxia [e.g., COPD exacerbation])
- Gastrointestinal (bleeding with anemia, *C. difficile*, colitis)

Retention problems (urinary retention, constipation)

- **Practical Tip #1:**
Check for urinary retention with a bladder scanner!



Physical Restraints in the Medically Ill Elderly

Pitfall #1: Restraints are necessary to prevent morbidity such as falls, and help with delirious pts.

- Physical restraints increase risk of *developing* delirium by 4.4x *Precipitating Factors in Hospital-Acquired Delirium, Inouye and Charpentier, JAMA 1996; 275: 852-57*
 - Additional morbidities (eg: pneumonia, DVT, stasis ulcers) and mortality risk

In 2001, the Ontario government passed Bill 85, the *Patient Restraints Minimization Act*

Avoid limb or posey restraints in the frail elderly!



Predisposing Factors

Inouye, SK et al. A predictive model for delirium in hospitalized elderly medical patients based on admission characteristics. *Ann Intern Med* 1993; 119:474-481

- ✿ cognitive impairment
- ✿ sleep deprivation
- ✿ immobility
- ✿ visual impairment
- ✿ hearing impairment
- ✿ dehydration

Practical tip #2: Ask about use of visual and hearing aids! Carry a voice amplifier



General considerations: Diagnosing Geriatric Delirium

- 24 hr. observation, including sleep-wake cycle
- anxiety
- new incontinence
- unsteady gait, falls
- dysarthria/incoherence
- mood/affect lability
- subtle paranoia and hypervigilance

Practical tip #3: Ask specifically about vivid dreams or nightmares!



Pharmacological Management of Delirium

- ✿ “Haloperidol as treatment of choice”
 - ✿ APA Guidelines 1999
- ✿ Other conventional antipsychotics
 - ✿ Loxapine (Loxapac)
 - ✿ Chlorpromazine
 - ✿ Methotrimeprazine (Nozinan)
 - ✿ Perphenazine
- ✿ Atypical antipsychotics
 - ✿ Risperidone, Olanzapine, Quetiapine



Haloperidol in Delirium Management

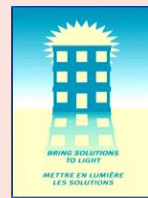
- ✿ Comparator to atypicals (3 RCT's in Cochrane)
 - ✿ Prolonged QTc, especially I.V.— baseline ECG
 - ✿ Risk of Extrapyrarnidal Symptoms, esp. elderly
 - ✿ >4.5 mg/day in Cochrane Review
 - ✿ “Evidence” based on 1 RCT (Breitbart 1996)
 - ✿ AIDS Dementia population; CPZ, Haldol, Lorazepam
- Pitfall #2: Haloperidol is best treatment as best evidence**



Pharmacologic Management

We recommend...

- Antipsychotics are the treatment of choice to manage the symptoms of delirium (with the exception of alcohol or benzodiazepine withdrawal delirium). (B)
- Haloperidol is suggested as the antipsychotic of choice based on the best available evidence to date. (B) Initial dosages are in the range of 0.25 mg- 0.5 mg. Od-bid (D)
- Atypical antipsychotics may be considered as alternative agents as they have lower rates of extra-pyramidal signs. (B)
- Benztropine should not be used prophylactically with haloperidol in the treatment of delirium. (D)





Pharmacologic Management

We recommend...

- In older persons with delirium who also have Parkinson's Disease or Lewy Body Dementia, atypical antipsychotics are preferred over typical antipsychotics. (D)
- Sedative-hypnotic agents are recommended as the primary agents for managing alcohol withdrawal delirium (B). Their use in other forms of delirium should be avoided (D).





Antipsychotics for Delirium

from: Chan, BC Med J. Oct 2011

Medication	Trade Name	Category	Starting Dose (mg)	Usual Dose Range (mg)	Routes of Administration
Loxapine	Loxapac	Conventional	5-15	5-100	IV, IM, SC, PO
Methotrimeprazine	Nozinan	Conventional	2.5-10	2.5-100	IV, IM, SC, PO
Chlorpromazine	Largactil	Conventional	6.25-12.5	2.5-100	IM, SC, PO
Perphenazine	Trilafon	Conventional	1-2	2-16	IV, IM, PO
Haloperidol	Haldol	Conventional	0.5-1.0	0.5-5	IV, IM, SC, PO
Risperidone	Risperdal	Atypical	0.5-1.0	0.25-3	PO liq/tabs, SL
Olanzapine	Zyprexa	Atypical	1.25-5	2.5-15	PO, SL, IM
Quetiapine	Seroquel	Atypical	12.5-50	12.5-200	PO (IR, XR)



Loxapine in Delirium Management

- Conventional antipsychotic with atypical properties
 - Singh et al *Journal of Psychiatry and Neuroscience*, 21:29-35
- Mid-potency in D₂ receptor blockade
- Effect on D₁, D₄, 5-HT₂, NMDA receptors
- Parenteral IM/SC (IV in monitored setting)

An Open Label Evaluation of Outcome in Hospitalized Delirious Post-Surgical Older Adults Treated With Loxapine

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Loxapine: An Open Label Study

★ Inclusion criteria

- ★ UBC IRB-approved
- ★ Consecutively admitted Jan 1/01-Mar 31/01 (VGH)
- ★ Post-operative care, including CABG (not ICU)
- ★ Age 55 y.o. or older
- ★ DSM-IV Diagnosis of Delirium
- ★ Patient or Substitute Decision Maker consent



Loxapine: An Open Label Study

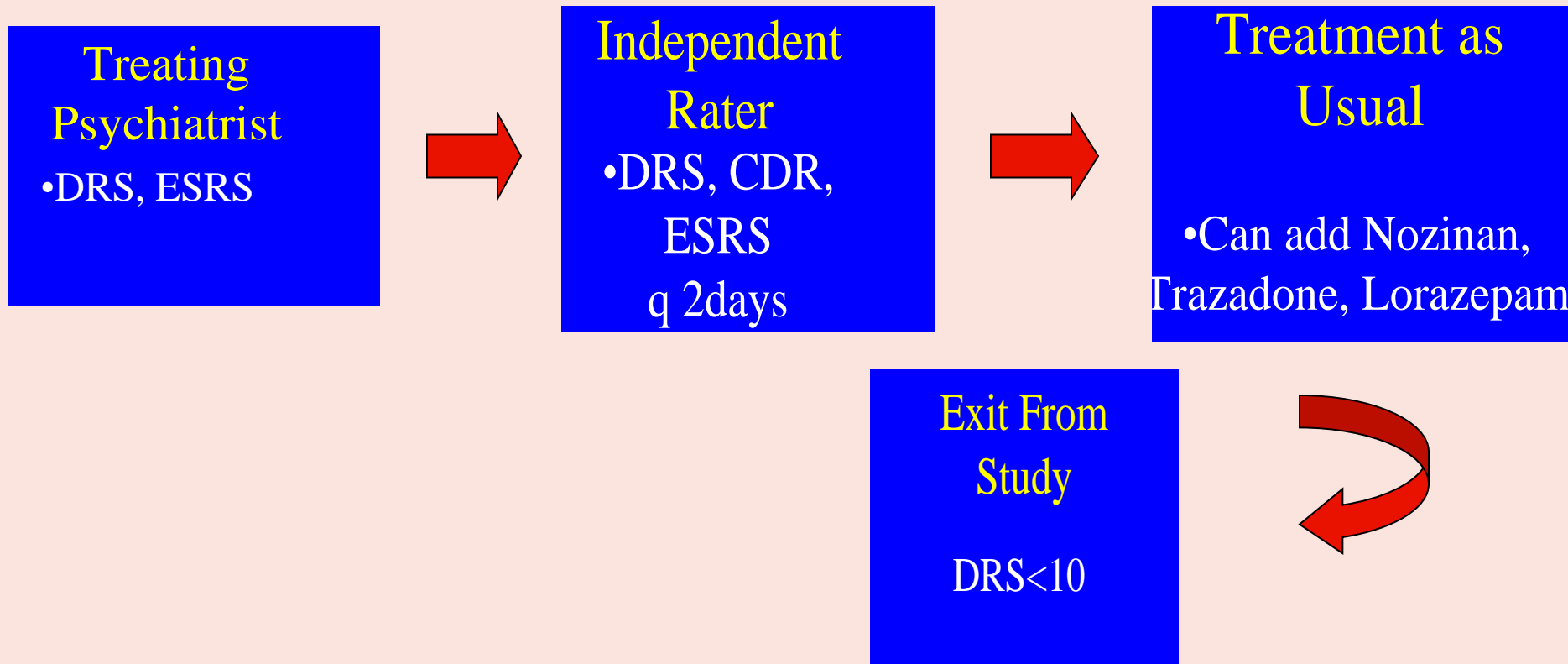
✦ Exclusions

- ✦ Head Injury
- ✦ NMS or hx. Adverse reaction to Loxapine
- ✦ Hx. Of Lewy Body Dementia or Parkinson's Disease
- ✦ CDR score for severe Dementia
- ✦ $QT_c = >450$ msec.
- ✦ Not currently on Haloperidol when enrolled



Loxapine: An Open Label Study

◆ Evaluation Procedure





Loxapine: An Open Label Study

- ★ Adverse events
 - ★ ESRS
 - ★ Adverse incident reports
 - ★ Mortality



Loxapine: An Open Label Study

★ Demographic data

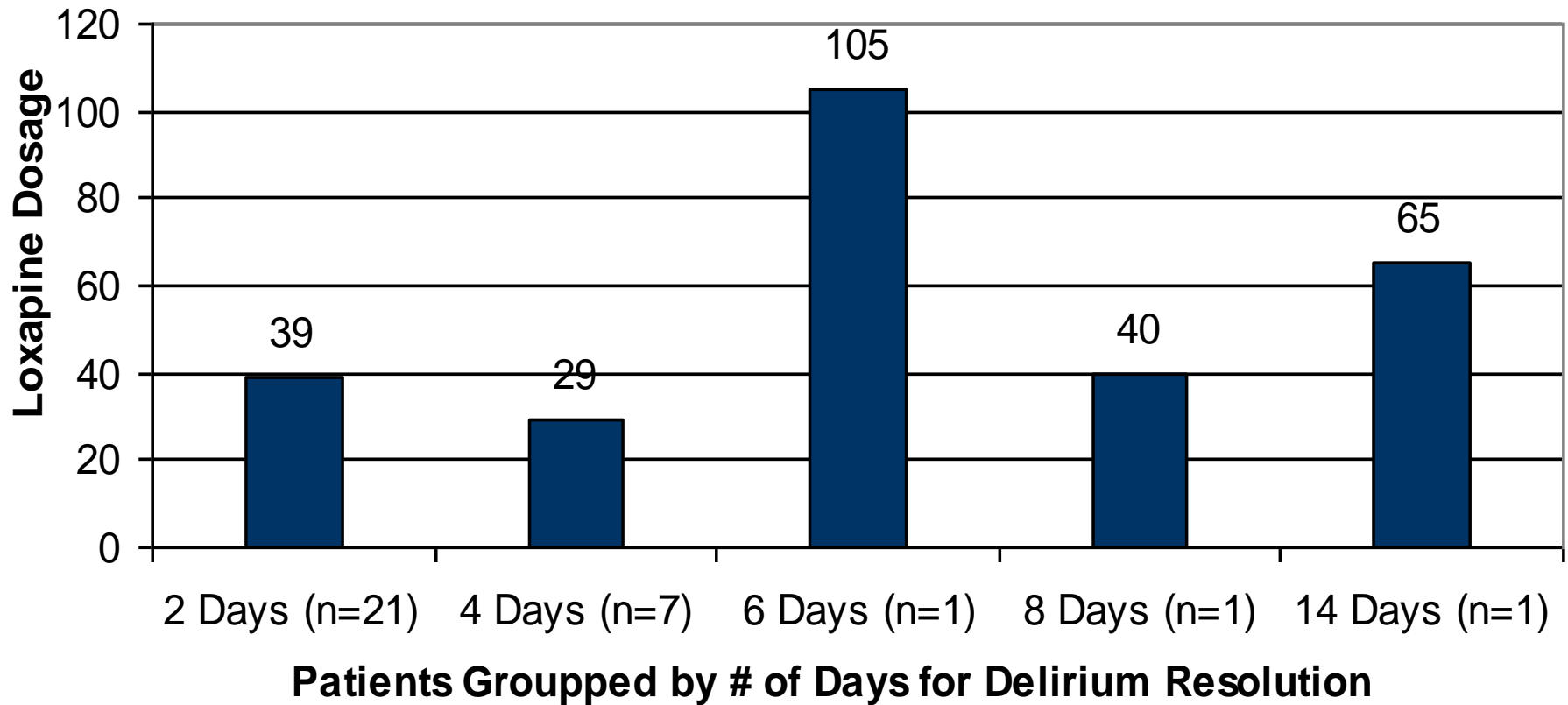
- ★ n=31
- ★ Age: 73.9 y. o. (60-85)
- ★ 68% M: 32% F
- ★ 71% Indep. Living pre-operatively
- ★ 13% regular ETOH use (no withdrawal delirium)
- ★ 26% Hx. Delirium
- ★ 6% Known Dementia



Loxapine: An Open Label Study

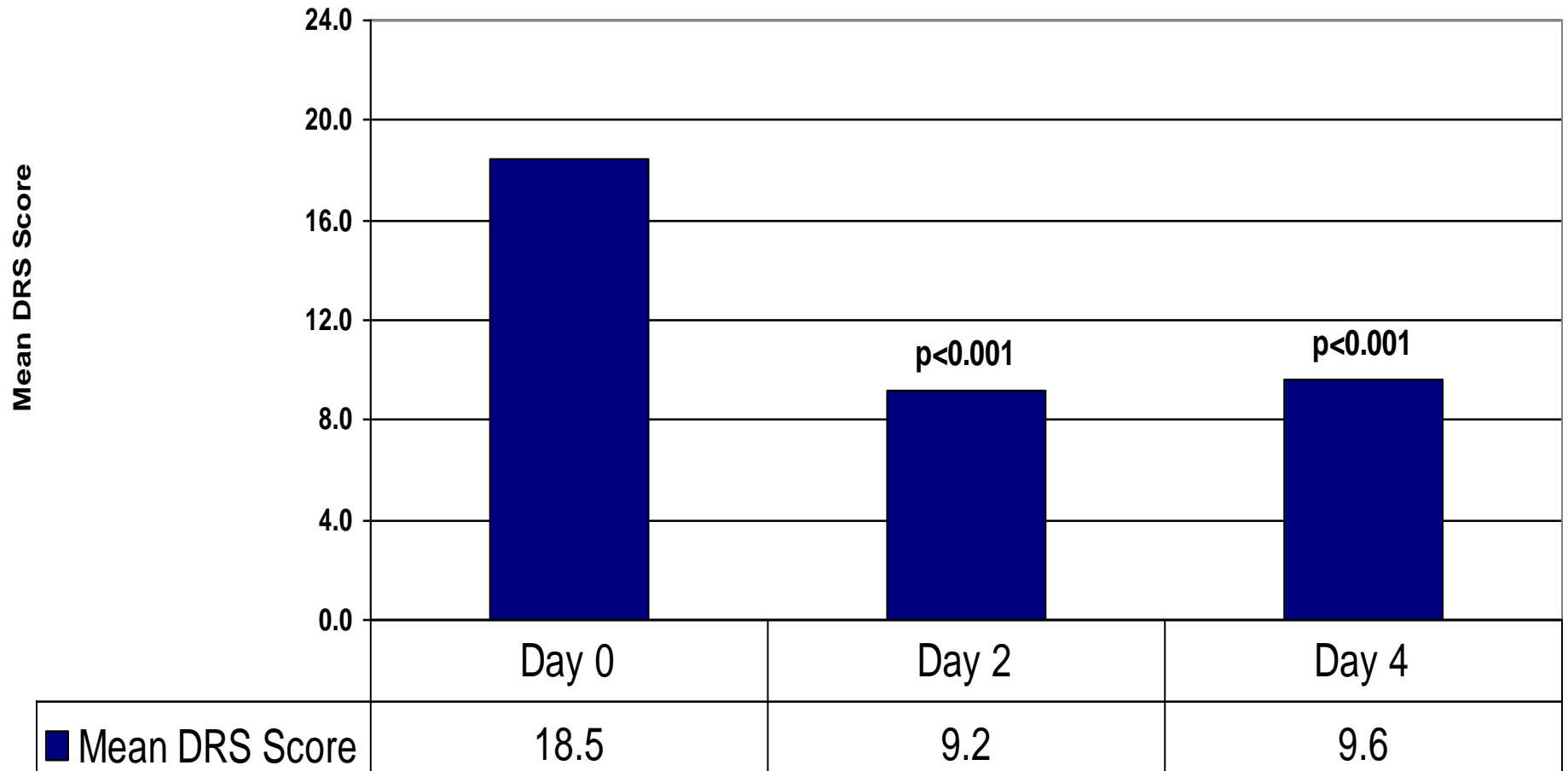
- ★ Pre-treatment Results
 - ★ 87% agitated vs. 13% apathetic
 - ★ Causes: 39% narcotic, 39% “post-op”
 - ★ $DRS=18.5\pm4.4$ (10-28)

Daily Total Dosage of Loxapine vs. Patients Grouped by Number of Days for Delirium Resolution



Range of Loxapine Dose=10-105 mg/day

**Mean DRS scores at Baseline, Day 2 and Day 4 after treatment with Loxapine
(All subjects, n=31)**



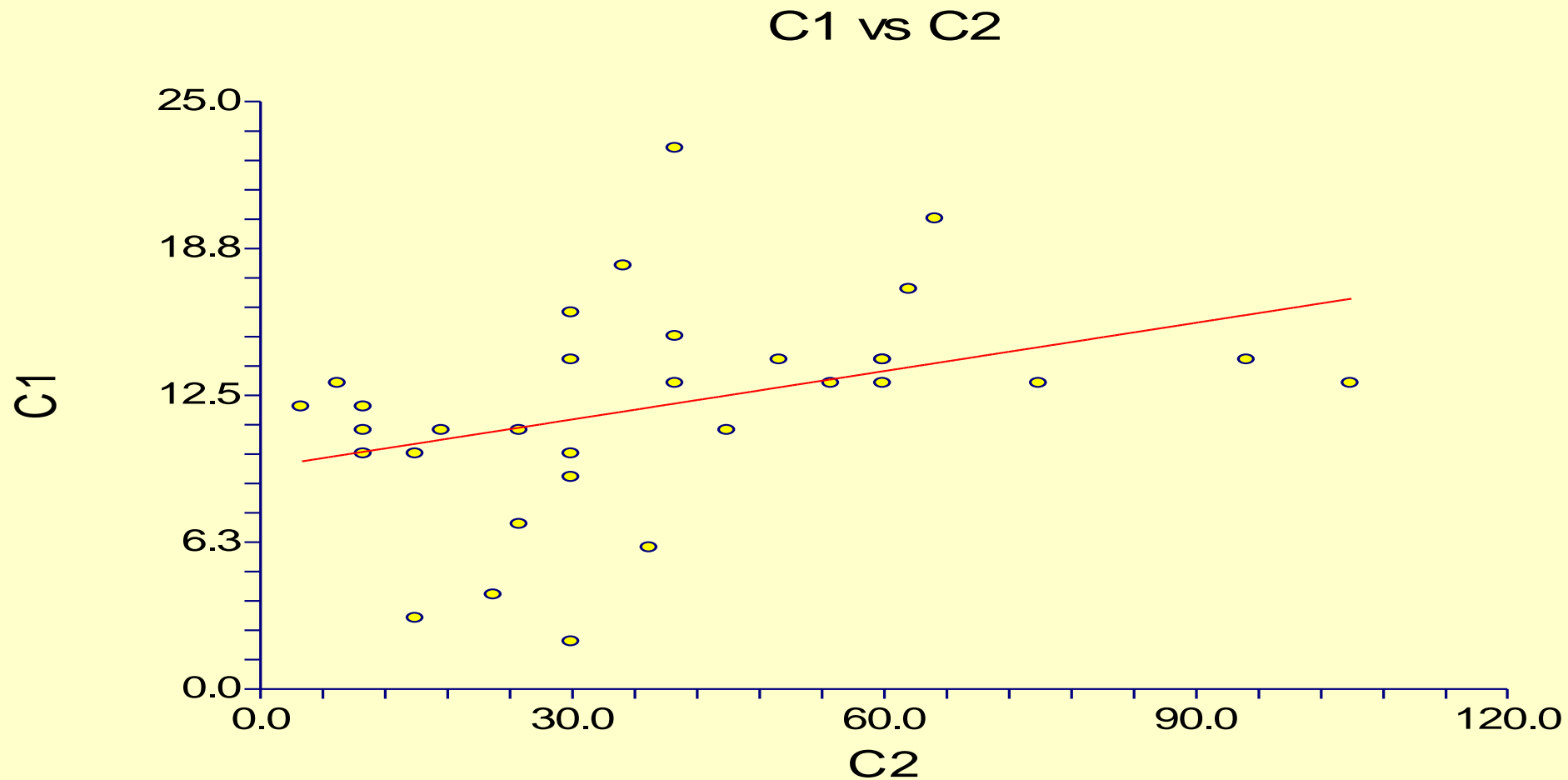
**10 subjects with Delirium > 2 days
p=0.0011 (DRS 2 vs. DRS 4)**



Delirium Resolution

- ✿ Mean DRS (whole sample)
 - ✿ DRS 0: 18.5 ± 4.4
 - ✿ DRS 2: 9.2 ± 5.7
 - ✿ DRS 4: 9.6 ± 3.9
- ✿ Mean days for resolution
 - ✿ Days: 3.2 ± 2.46 (2-14)

Loxapine Dose (x-axis) and DRS Symptom Reduction (y-axis)



• $R=0.3789$; $P=0.00325$; mean dose=39 mg/d



Loxapine: An Open Label Study

★ Adverse Effects

- ★ 10% EPS (n=3)
- ★ No cardiac-related side effects
- ★ 1 death
 - ★ Thrombocytopenia in cancer patient
 - ★ Believed to be unrelated to Loxapine



Loxapine: An Open Label Study

- ✿ Excluded patients from analysis
 - ✿ N=11
 - ✿ Most because of refusal or inability to consent
 - ✿ Some with $QT_c > 450$ msec
 - ✿ Some discharged before follow-up evaluation



Loxapine: An Open Label Study

★ Conclusions

- ★ Rapid resolution of delirium in majority of post-operative geriatric patients in a teaching hospital setting
- ★ Loxapine is safe, effective, and well-tolerated
- ★ Higher doses of Loxapine correlated with greater delirium (DRS) reduction
- ★ Limited by lack of control or comparator group

PRESCRIBER'S ORDERS

ADDRESSOGRAPH

COMPLETE OR REVIEW ALLERGY STATUS PRIOR TO WRITING ORDERS

Delirium Treatment in the Frail Elderly Page 1 of 2

(Items with check boxes must be selected to be ordered)

Date: _____ Time: _____ Weight: _____ kg ☐ Actual ☐ Estimate

Time Processed
 RN/LPN Initials
 Comments:

CONFUSION ASSESSMENT METHOD (CAM) SCORE: 1 and 2 plus 3 and/or 4

ACTIVITY: Mobilize out of bed in chair for 3X/day (preferably for meal times).

CONSULTS: If delirium persist greater than 2 days or patient needs 1:1/ restraint/Code White
☐ Consult either ☐ Geriatric Medicine **OR** ☐ Geriatric Psychiatry.

- ☐ Clinical pharmacist for medication review.
- ☐ Physiotherapist ☐ Dietician ☐ Occupational Therapist.
- ☐ Contact POPS if patient is followed by that service.

MONITORING:

- Initial CAM assessment. (Refer to PCG# C-590)
- Do CAM assessment per shift.
- ☐ Implement unit bowel protocol, please specify:

- Review indication for foley catheter. If no urine output in 8 hours, measure post-void residual. (I & O catheterization or use bladder scanner for post-void residual urine volume.) If residual > 250 mL, insert indwelling foley and review in 24 hours.
- O2 to keep saturations ≥ 90%. Notify physician if O2 saturations < 90% at 4L nasal prongs.

LABORATORY: ☐ CBC/diff, electrolytes, glucose, creatinine, urea
☐ Calcium, albumin, total protein, GGT, alkaline phosphatase, ALT
☐ Blood cultures if Temp greater than 38°C X 1 set
☐ Troponin ☐ Urinalysis ☐ Urine C & S

DIAGNOSTICS: ☐ CT scan of head (if **new** neurological findings)
☐ _____
☐ 12 Lead ECG
☐ Chest X-ray

PPO: Pg 2

MEDICATIONS:

For agitation or night time restlessness .

EITHER:

- ☐ Loxapine 2.5 mg NG or PO or subcutaneous at 1600H and 5 mg at 2000H.
with
- ☐ Loxapine 2.5 mg to 5 mg NG or PO or subcutaneous Q1H PRN
(to maximum of 25 mg per day) for agitation/confusion

OR (IF patient has Parkinson Disease/Lewy Body Dementia then order Quetiapine).

- ☐ Quetiapine 6.25 mg NG or PO at 1600H and 12.5 mg at 2000H.
with
- ☐ Quetiapine 6.25 mg to 12.5 mg NG or PO Q2H PRN (to maximum of 50 mg per day) for
agitation/confusion

If unable to give Quetiapine NG or PO then:

- ☐ Methotrimeprazine (Nozinan®) 2.5 mg subcutaneous at 1600H and 5 mg at 2000H
with
- ☐ Methotrimeprazine (Nozinan®) 2.5 mg to 5 mg subcutaneous Q1H PRN (to maximum of
25 mg per day).

Vancouver Health
VGHUBCHGFS
PRECRIber'S ORDERS
COMPLETE OR REVIEW ALLERGY STATUS PRIOR TO WRITING ORDERS
Delirium Treatment in the Frail Elderly Page 2 of 2
(Items with check boxes must be selected to be entered)

DATE: _____

MEDICATIONS:
For agitation or night time restlessness .

EITHER:

- ☐ Loxapine 2.5 mg NG or PO or subcutaneous at 1600H and 5 mg at 2000H
with
- ☐ Loxapine 2.5 mg to 5 mg NG or PO or subcutaneous Q1H PRN
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agitation/confusion



Subsequent Considerations

- ✿ Risks of Atypical Antipsychotics
 - ✿ Mortality
 - ✿ CVA or related events
- ✿ Use of Cholinesterase Inhibitors?
- ✿ Use of Melatonin?



CIWA Protocol at VGH

- ★ Protocol differs for:

- ★ Age 69 and under vs. Age 70 and over
- ★ In “older”:
 - ★ no diazepam
 - ★ lower lorazepam doses
 - ★ use of CAM to screen for concurrent delirium

Pitfall #3: Ask about alcohol and hypnotic use. Frail, medically ill seniors usually don't drink as much as estimated, but take more hypnotics than estimated.



Inappropriate use of Symptom-Triggered Therapy for Alcohol Withdrawal in the General Hospital

Hecksel et al. Mayo Clin. Proc. 2008;83(3)

- 124 OF 495 PATIENTS RX WITH CIWA PROTOCOL IN TWO MAYO CLINIC AFFILIATED HOSPITALS
- 52 % - 64/124 OF PATIENTS RX DID NOT MEET INCLUSION CRITERIA
- 14 % - 9 PTS UNABLE TO COMMUNICATE
- 55 % - 35 PTS HAD NO RECENT ALCOHOL HX
- 31 % - 20 PTS MET NEITHER CRITERIA



CIWA in Older Adults

- ★ **Physician to reassess for regular dosing on a daily basis**
 - ★ **Nurse to screen for delirium using Confusion Assessment Method (CAM) and to call physician if CAM screen is positive.**
 - ★ Nurse to call if CIWA \geq 20 or Lorazepam \geq 10mg/24hrs or seizure or HR $>$ 120 or SBP $>$ 180 or DBP $>$ 120
 - ★ If CIWA-Ar score 0 to 9, call MD to have regular benzodiazepine dose tapered.
- ★ **PRN:**
 - ★ **Lorazepam 0.5 to 1 mg PO or SL or IM or SUBCUT Q1H PRN**
- ★ **CIWA-Ar Score and dosing of lorazepam PRN:**
 - ★ 0 to 9 No Medication Q1H x 3, then Q6H x 24 hours, then Q24H x 72 hours
 - ★ 10 to 19 0.5 or 1 mg Q1H PRN Q1H until score below 10
 - ★ 20 or greater Call Physician Q30 to 45 MIN until score below 20
- ★ **Stop CIWA-Ar and call physician if patient confused, agitated, or drowsy.**



Alcohol Withdrawal

- ✿ Is there a prophylactic role of:
 - ✿ Magnesium?
 - ✿ Valproic acid?



Prognosis of Geriatric Delirium

- ✿ Increased mortality in hospital and up to 1 year post (Leslie et 2005, McCusker 2003, McAvay 2006)
- ✿ Increased morbidity: LOS, functional decline, institutional care (Leentjens 2005, Rockwood 2001, McCusker 2003, McAvay 2006)
- ✿ Up to 30-60% still have cognitive deficits at 1 month (Levkoff 1992, Rockwood 1993, McCusker 2003, Marcantonio 2003)
- ✿ Episode of Delirium may herald Dementia (Rockwood 1999)
- ✿ Those with Dementia and Delirium are less likely to achieve pre-Delirium cognitive and functional baseline status (McCusker 2001) and have a longer course of delirium (Dasgupta 2010, Boettger 2011)



Pearls and Pitfalls

Practical tips

- Check for urinary retention with a bladder scanner!
- Ask about use of visual and hearing aids! Carry a voice amplifier.
- Ask specifically about vivid dreams or nightmares!

Pitfalls

- Restraints are necessary to prevent morbidity such as falls, and help with delirious pts.
- Haloperidol is best treatment as best evidence
- Ask about alcohol and hypnotic use. Frail, medically ill seniors usually don't drink as much as estimated, but take more hypnotics than estimated.



Web Resources

- ★ Care for Elders Interactive Delirium Module
 - ★ [UBC Division of Geriatric Psychiatry](http://www.careforelders.ca)
 - ★ www.careforelders.ca
- ★ VIHA Delirium information
 - ★ www.viha.ca/mhas/resources/delirium
- ★ Canadian Coalition of Seniors Mental Health
 - Clinical practice guidelines (2006)
 - www.ccsmh.ca
- BCMJ Oct 2011: Chan, “Clarifying the Confusion about Confusion: Current Practices in Managing Geriatric Delirium”